



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

87884 7590 12/28/2009

Mossman, Kumar and Tyler, PC  
11200 Westheimer Road  
Suite 900  
Houston, TX 77042

EXAMINER

MCCAIG, BRIAN A

ART UNIT

PAPER NUMBER

1797

DATE MAILED: 12/28/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/588,341

08/03/2006

John A. Schield

194-37438-US

8231

TITLE OF INVENTION: HYDROCARBONS HAVING REDUCED LEVELS OF MERCAPTANS AND METHOD AND COMPOSITION USEFUL FOR PREPARING SAME

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	03/29/2010

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

87884 7590 12/28/2009

Mossman, Kumar and Tyler, PC  
11200 Westheimer Road  
Suite 900  
Houston, TX 77042

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/588,341 08/03/2006 John A. Schield 194-37438-US 8231

TITLE OF INVENTION: HYDROCARBONS HAVING REDUCED LEVELS OF MERCAPTANS AND METHOD AND COMPOSITION USEFUL FOR PREPARING SAME

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
-------------	--------------	---------------	---------------------	----------------------	------------------	----------

nonprovisional NO \$1510 \$300 \$0 \$1810 03/29/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
----------	----------	----------------

MCCAIG, BRIAN A 1797 585-001000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,341	08/03/2006	John A. Schield	194-37438-US	8231
87884	7590	12/28/2009	EXAMINER	
Mossman, Kumar and Tyler, PC 11200 Westheimer Road Suite 900 Houston, TX 77042			MCCAIG, BRIAN A	
			ART UNIT	PAPER NUMBER
			1797	
			DATE MAILED: 12/28/2009	

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 473 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 473 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/588,341	SCHIELD ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	BRIAN MCCAIG	1797	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to August 19, 2009.
2. ☒ The allowed claim(s) is/are 1-13 and 16-25, renumbered as 1-23, respectively.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br/>Paper No./Mail Date _____</li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br/>of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____.</li> <li>7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____.</li> </ol> |
|---|---|

/ROBERT J. HILL, JR/  
Primary Examiner, Art Unit 1797

BAM  
12/16/2009

Art Unit: 1797

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

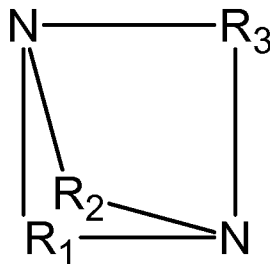
Authorization for this examiner's amendment was given in a telephone interview with Gene L. Tyler on December 9, 2009, concerning claim 1 and December 16, 2009, concerning claims 16, 22, and 23.

The application has been amended as follows:

Please amend the claims as follows:

1. A composition useful for reducing the concentration of mercaptans in hydrocarbons comprising:

(A) a first component having the general formula:



wherein: (i) R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are independently saturated or unsaturated alkyl groups, and (ii) at least two of R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> include a chain of at least two carbon atoms bonded to the two N atoms;

(B) a second component comprising a nucleophilic acceptor;

(C) an alcohol selected from dipropylene glycol, 1,4-butanediol, and isopropanol; and

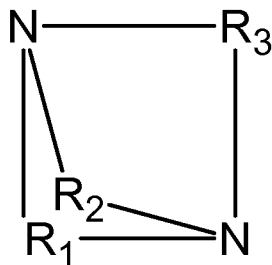
(D) a sour hydrocarbon;

wherein components A, B, and C are admixed with the sour hydrocarbon.

Art Unit: 1797

16. A method of reducing the concentration of mercaptans in a hydrocarbon comprising admixing a composition comprising:

(A) a first component having the general formula:



wherein: (i) R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are independently saturated or unsaturated alkyl groups, and (ii) at least two of R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> include a chain of at least two carbon atoms bonded to the two N atoms;

(B) a second component comprising a nucleophilic acceptor; and

(C) an alcohol selected from dipropylene glycol, 1,4-butanediol, and isopropanol

with a hydrocarbon having a first concentration of mercaptans greater than 0 under reaction conditions sufficient to produce a hydrocarbon having a second concentration of mercaptans that is less than the first concentration of mercaptans.

17. The method of claim 16 wherein the composition is present at a concentration of from about 10 to about 1000 parts per million (ppm).

18. The method of claim 17 wherein the composition is present at a concentration of from about 100 to 900 ppm.

19. The method of claim 17 wherein the composition is present at a concentration of from about 100 to 200 ppm.

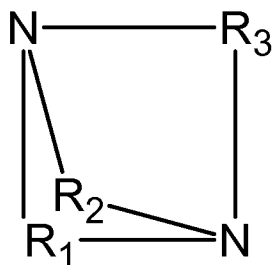
Art Unit: 1797

20. The method of claim 16 wherein the composition is admixed with the hydrocarbon using an in-line mixer.

21. The method of claim 16 wherein the composition is admixed during shipping.

22. The method of claim 16 additionally comprising the steps of determining the hydrogen sulfide content of the hydrocarbon and using a hydrogen sulfide scavenger to reduce the level of hydrogen sulfide before admixing the hydrocarbon with the composition comprising:

(A) a first component having the general formula:



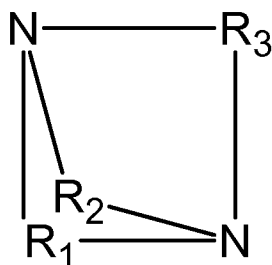
wherein: (i) R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are independently saturated or unsaturated alkyl groups, and (ii) at least two of R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> include a chain of at least two carbon atoms bonded to the two N atoms;

(B) a second component comprising a nucleophilic acceptor; and

(C) an alcohol selected from dipropylene glycol, 1,4-butanediol, and isopropanol.

23. A hydrocarbon having a reduced concentration of mercaptans comprising a product of admixing a composition comprising:

(A) a first component having the general formula:



Art Unit: 1797

wherein: (i)  $R_1$ ,  $R_2$ , and  $R_3$  are independently saturated or unsaturated alkyl groups, and (ii) at least two of

$R_1$ ,  $R_2$ , and  $R_3$  include a chain of at least two carbon atoms bonded to the two N atoms;

(B) a second component comprising a nucleophilic acceptor; and

(C) an alcohol selected from dipropylene glycol, 1,4-butanediol, and isopropanol,

with a hydrocarbon having a first concentration of mercaptans greater than 0 under reaction conditions

sufficient to produce a hydrocarbon having a second concentration of mercaptans that is less than the first concentration of mercaptans.

Please cancel claims 14 and 15.

2. The following is an examiner's statement of reasons for allowance: The prior art of record does not appear to anticipate or render obvious the requirement of all four components of the composition. The prior Office action asserted that the claims of the invention would have been unpatentable over Thompson et al (US 4129455) or Petty (US 2927946) in view of Dobinson et al (US 3707552). Thompson et al disclosed the composition with the exception of the sour hydrocarbon. The first component was diazabicyclooctane [column 1, line 68 to column 2, line 2 & example 1]. The second component was toluene diisocyanate [example 1] and the solvent was dipropylene glycol [examples 1 & 4]. However, Thompson et al is concerned with dispersions of solids such as pigments and dyestuffs, in organic liquids. There is no mention of a sour hydrocarbon nor would there have been any motivation for one of ordinary skill in the art to modify the teaching of Thompson et al to include a sour hydrocarbon. The closest discussion to a sour hydrocarbon in Thompson et al is the teaching of the  $\beta$ -mercaptoethanol monomer in the formation of addition polymer B [column 4, lines 48-63]. However, this is not a sour hydrocarbon as construed by the applicant in paragraph 0004 of the published application nor would it have been interpreted as such by one having



Art Unit: 1797

ordinary skill in the art. Petty discloses composition useful for the reduction of mercaptans in a sour hydrocarbon such as an epoxide. Petty, however, does not disclose that the composition is comprised of the first component. Dobinson et al was used in the prior Office action with Petty based on the motivation that combining the teaching of Petty with the tertiary amine (specifically, triethylene diamine), would accelerate the rate of reaction between aliphatic mercaptans and epoxides in a sour hydrocarbon. However, neither Petty nor Dobinson et al disclose the use of any of the recited alcohols in claim 1. The alcohols mentioned in Petty are phenols [see, e.g., column 3, lines 20-21].

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571) 270-5548. The examiner can normally be reached on M-F 8-430.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM  
12/10/2009

/ROBERT J. HILL, JR/  
Primary Examiner, Art Unit 1797

Application/Control Number: 10/588,341

Page 7

Art Unit: 1797